

Notes on the Genus *Dicranoptycha* Osten Sacken (Tipulidae, Diptera).

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The genus *Dicranoptycha* was erected by Osten Sacken in 1859 to include four closely allied crane-flies from the eastern states. In 1910, Coquillett designated the first of these four species, *D. germana*, as the genotype. Later on, in the *Monographs* (1869), Osten Sacken relegated *D. sororcula* to the synonymy of *D. sobrina*, where it still remains. Besides the four valid Nearctic species, there are two European species of the genus. The Oriental *D. signaticollis* v.d.W. is undoubtedly a *Libnotes* rather than a *Dicranoptycha*. The known species of the genus are all very closely related and are separable only on slight differences of color and structure.

Of the American species, *D. germana* O. S., the largest form, is characteristic of the Canadian life-zone and its range rarely overlaps those of the other species. The three remaining forms, together with the two species described in this paper, are characteristic of the Austral and lower Transitional life-zones. They frequent open woods, often but not necessarily near water, and several species may be found flying together. Thus at Plummer's Island, Maryland, in July, 1915, Mr. McAttee and the writer found *D. sobrina* and *D. winnemana* commonly. At Lawrence, Kansas, in July and August, three species fly commonly at the same time, *D. winnemana*, *D. minima* and *D. tigrina*. These species appear on the wing in about the order given, *D. winnemana* emerging first in early June, *D. minima* in early July and *D. tigrina* in mid-July, though all three species continue on the wing throughout August and most of September. They frequent the open Austral woodlands such as North Hollow on the University Campus and in such situations may be found resting on the leaves of tall herbage and low shrubbery. They are almost invariably the only Limnobiinae occurring but fly with a number of species of *Tipula* which have a much shorter flight period (*Tipula dictyana*, *T. mingwe*, *T. morrisoni*, *T. unimaculata*, *T. umbrosa*, *T. flavoumbrosa*, *T. flavibasis*, etc.).

The general distribution of the American species has been indicated by the writer in an earlier paper (*Proc. Acad. Nat. Sci., Phila.*, 1916, pp. 496, 497). All of the species are comparatively restricted in distribution excepting *D. sobrina*. In the *Monographs* (1869, p. 117) Osten Sacken stated that the Californian specimens represented a new species which he did not characterize. In his *Western Diptera* (1877, pp. 197, 198),

however, he indicated that the species was very probably *D. sobrina*. I have examined a great number of specimens from the western states and must state that I cannot distinguish the material from typical eastern *sobrina* and so must consider this species as being trans-continental, the widest distribution for any species of the genus. Specimens from New Mexico break this rather discontinuous range of *sobrina* and the species may be looked for in Texas and other intermediate states. *D. nigripes* is still known only from the unique type taken in Georgia. Specimens that were distributed by me under this name are herein described as a new species, *D. minima*. *D. winnemana*, described from Plummer's Island, Maryland, ranges from Maryland and Georgia westward to Kansas. The new species described below have as yet been found only in scattered localities in Douglas County, Kansas, but unquestionably have a wide range in this section.

The larvae of the species that I have reared, *D. winnemana* and *D. minima*, are very similar to one another and are very characteristic in appearance. They are unusually elongate, slender, the body terete; the skin very thin, glassy, entirely transparent, and glabrous so that the head-capsule and contents of the alimentary tract show through as clearly as through a very thin glass. The head-capsule is of the massive Linnobiine type and is readily told from all other crane-flies with the exception of *Epiphragma* by the three-toothed mentum. The spiracular-disk is comparatively small, surrounded by four small, slender, pointed lobes, two being lateral and two ventral in position. The inner face of these lobes and the disk itself are variously marked with black lines. The anal swelling is fleshy and highly protuberant. The larvae live in the moist or rather dry earth where they occur beneath the surface layer of leaf-mold and other debris. The pupa is likewise very characteristic since it apparently lacks pronotal breathing horns, these being sessile as in the higher Diptera. The pupa lives encased in a small, oval case of earth. The above observations were made on material reared by my wife, Mabel M. Alexander. Detailed observations on the immature stages of this interesting genus are given in another paper.

A Key to the American species of Dicranoptycha.

1. Wings with a strong reddish-brown or fulvous tinge; *Rs* notably longer than cell 1st *M*₂; Canadian life-zone. (Northeastern United States).....*germana* O. S.
 Wings not strongly fulvous; *Rs* approximately as long as cell 1st *M*₂; Austral and Transitional life-zones.....2
2. Tips of the femora conspicuously black; abdominal tergites uniformly light brown or yellow.....3

- Tips of the femora not black; abdominal tergites banded or at least the seventh segment blackish.....4
3. Size large (male, length, about 10 mm.); wings brownish yellow; male hypopygium with the gonapophyses acicular, prominent. (Georgia).*nigripes* O. S.
Size small (male, length, under 8 mm.); wings brown; male hypopygium with the gonapophyses small, not projecting. (Kansas).*minima*, sp. n.
4. Coloration yellow, the wings deep yellowish. (Eastern United States).*winnemana* Alex.
Coloration brown or gray; wings pale brownish or grayish.5
5. Abdominal tergites uniformly dark brown or only the seventh segment darker; male hypopygium with the gonapophyses not acicular or projecting. (United States).....*sobrigna* O. S.
Abdominal tergites banded, tigrine in appearance, the apical third of each segment pale; male hypopygium with the gonapophyses acicular, prominent. (Kansas).*tigrina*, sp. n.

Dicranoptycha tigrina, sp. n.

♂.—Length, 9 mm.; wing, 9.8-10 mm. ♀.—Length, 10 mm.; wing, 9.3-9.5 mm.

Rostrum reddish. Palpi black. Antennae with the scape reddish yellow, the flagellum black. Head grayish brown, the vertex narrow.

Mesonotum dark brown with a sparse brownish yellow pollen and without distinct stripes. Pleura clear gray becoming more yellowish below. Halteres pale. Legs with the coxae brownish yellow, the anterior coxae darker brown; femora brownish yellow, the tips of the femora darker brown; tibiae and tarsi brown. Wings with a strong gray tinge, highly iridescent; veins dark brown. Venation: *Sc* moderately elongated, extending to about midlength of the basal deflection of *R*₄₊₅; *Rs* moderately elongated, about as long as the long cell 1st *M*₂ and half again as long as the deflection of *R*₄₊₅; basal deflection of *Cu*₁ inserted at or before one-third the length of cell 1st *M*₂.

Abdominal tergites dark brown, the apical third of each segment more yellowish, producing a banded or tigrine appearance; segment seven dark brownish black; hypopygium reddish yellow. Sternites similar but the pale posterior margins to the segments are still broader. Male hypopygium with the dorsal pleural appendage bent at a right angle before midlength, the long apical point provided with numerous setae; ventral pleural appendage a short, broad, flattened blade, with a short curved tip and the inner margin with 8 or 9 acute serrations. Gonapophyses long, acicular, projecting conspicuously between the pleurites.

Habitat: Kansas.

Holotype, ♂, Lawrence, Douglas County, Kansas, alt. 900 ft., July 16, 1918. *Allotopotype*, ♀. *Paratopotypes*, 50 ♂ ♀, July 16-30, 1918.

This species is apparently close to *D. nigripes* O. S. in the structure of the male hypopygium but the coloration of the wings and body are very different.

Dicranoptycha minima, sp. n.

♂.—Length, 6.7-7.2 mm.; wing, 6.5-7.8 mm. ♀.—Length, about 6.5 mm.; wing, 7-7.2 mm.

Rostrum brownish yellow. Palpi black. Antennae with the scape

bright yellow, the flagellum brownish black. Head brown; vertex rather broad.

Pronotum grayish brown. Mesonotum light brown without stripes; pseudosutural foveae distinct, black. Dorsal pleurites indistinctly grayish, the ventral pleurites yellow. Halteres brown. Legs with the coxae and trochanters yellow; femora dull yellow, the tips narrowly and abruptly blackened; tibiae yellowish brown, the extreme bases and tips a little darkened; tarsi brown, the metatarsi more yellowish. Wings with a strong brownish tinge, more yellowish basally and along the costa; veins dark brown, subcosta yellow. Venation about as in *D. tigrina*.

Abdomen yellowish brown without distinct darker markings; tergite seven concolorous with the other abdominal segments. Hypopygium yellowish. Male hypopygium with the dorsal pleural appendage flattened, very broad, the surface covered with setae. The narrow ventral appendage is produced into a long slender apical point. Gonapophyses short, not acicular or projecting conspicuously between the pleurites.

Habitat: Kansas.

Holotype, ♂, Lawrence, Douglas County, Kansas, alt. 900 ft., July 16, 1918. *Allotopotype*, ♀. *Paratopotypes*, 50 ♂ ♀.

The types of the new species are in the collection of the author. Paratypes have been placed in the leading collections of the country.

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Cordulegaster dorsalis (Odonata) as an Enemy of Trout.

Mr. Frank Springer writes from the Abbott Ranch, Rito de los Frijoles, New Mexico, Sept. 1, as follows:

"I am sending you some beasties, that I should like to know a little more about. They are highly predaceous devils, and I first discovered them in the act of seizing some of 'a lot of young trout which I was placing in the brook here. The bug lies buried in mud or sand, in shallow parts of the stream where the current is not very swift, with only his eyes projecting. When a little fish (about an inch long) comes wiggling along close enough over the bug, he snaps, projecting his formidable mandibles [lateral labial lobes] and the shovel-like part below them for quite a distance to the front, and catches the fish by his wiggling tail. By simulating the wiggling motion of a fish with a knife-blade, I could induce the bug to snap at it, and thus saw the motion several times. . . . I found the creatures quite numerous in the shallow, quieter waters where I was planting the young fry, and apparently they constitute a rather serious menace to the stocking of the stream, as they infest the shallow places, while the deeper water is dangerous on account of the older fish. I find that the trout eat these bugs to some extent, as in several instances they were contained in the stomach, and they are readily taken when offered as bait."

Specimens sent agree in all particulars with *Cordulegaster dorsalis* Hagen, as described and figured by Needham.—T. D. A. COCKERELL, Boulder, Colorado.